

*NABARD's Role in Spearheading
Climate Change Initiatives*

Climate Change Newsletter

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National Bank for Agriculture and Rural Development
Head Office, Mumbai

“Integration of Low Emission Pathways and Climate Resilience through Climate Smart Village approach is important for Sustainable Livelihoods”

Dr. Harsh Kumar Bhanwala
Chairman

Message



Climate Change is a global concern adversely affecting economies of every country and people are experiencing the significant impacts of climate change, which include changing weather patterns, rising sea level and more extreme weather events. The GHG emissions mainly

due to fossil fuel consumption and change in land use pattern is driving climate change and is expected to continue to rise. They are now at their peak levels and the world's average surface temperature is projected to surpass an increase of 4⁰ Celsius by end of this century. Affordable, scalable and implementable solutions are now available to enable countries to leapfrog to cleaner and more resilient economies. The pace of change is quickening as more people are turning to renewable energy that will reduce emissions and increase adaptation efforts. The monitorable action initiated by

Govt. of India such as achieving of 175 GW through renewable energy (of which 100 GW through solar energy) by 2022, afforestation in 5 mh area under Green India Mission, setting up of NAFCC for adaptation measures, etc. are welcome steps. The implementation of Paris Agreement which became effective from 4 November 2016, is essential for the Sustainable Development and to build climate resilience among local communities & ecosystems.

I am happy to note that the 3rd issue of the “Climate Change Newsletter” has highlighted the efforts of mitigation and adaptation of climate change and will provide valuable inputs to the project proponents engaged in preparation of climate change project proposals.

H.R.Dave
Deputy Managing Director

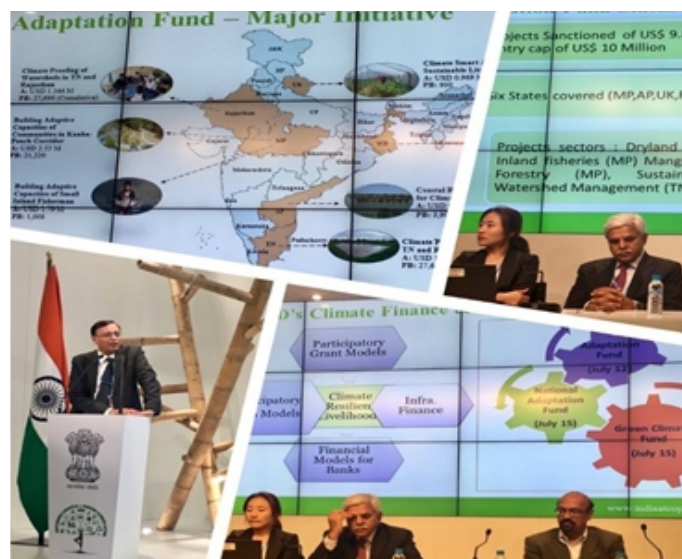
Facts and Figures

- ✓ 836 million people still live in extreme poverty and about one in five persons in developing regions live on less than \$1.25 per day. High poverty rates are often found in Southern Asia and sub-Saharan Africa small, fragile and conflict-affected countries.
- ✓ Globally, one in nine people in the world today (795 million) are undernourished.
- ✓ Agriculture is the single largest employer in the world, providing livelihoods for 40 per cent of today's global population. It is the largest source of income and jobs for poor rural households.
- ✓ 500 million small farms worldwide, most still rainfed, provide up to 80% tons of food consumed in a large part of the developing world. Investing in smallholder women and men is an important way to increase food security and nutrition.
- ✓ Energy poverty (1.4 billion people have no access to electricity worldwide) in many regions is a fundamental barrier to reducing hunger.
- ✓ 2.6 billion people have gained access to improved drinking water sources since 1990, but 663 million people are still without.
- ✓ 2.4 billion people lack access to basic sanitation services, such as toilets or latrines.
- ✓ More than 80 percent of wastewater resulting from human activities is discharged into rivers or sea without any pollution removal.
- ✓ Each day, nearly 1,000 children die due to preventable water and sanitation-related diarrhoeal diseases.
- ✓ Hydropower is the most important and widely-used renewable source of energy and as of 2011, represented 16 percent of total electricity production worldwide.
- ✓ Approximately 70 percent of all water abstracted from rivers, lakes and aquifers is used for irrigation.

Source: Sustainable Development Goals

Major Events During the Period - COP- 22 – Side Event of NABARD

NABARD successfully hosted a side event on “Climate Change Adaptation Actions in India” at India Pavilion during the 22nd meeting of Conference of Parties (COP 22) at Marrakech, Morocco on 8th November 2016. This was first time ever that NABARD hosted a separate side event during a COP meeting. The side event was aimed at deliberation on current policy framework and priorities, learnings from project and programs under implementation and understand barriers related to finance, technology, stakeholder engagement and scaling up of climate change adaptation actions. The event was chaired by Mr. H. R. Dave, Dy. Managing Director. The other panelists included eminent speakers and experts in the field of climate change adaptation, Mr. R. R. Rashmi, IAS, Special Secretary, MoEF&CC, Government of India; Ms. Young Hee Lee, Operations Analyst, Adaptation Fund; Ms. Sabine Preuss, Director, Environment and Climate Change, GIZ, India; Mr. Nambi Appadurai, Strategy Head, Climate Resilience Practice, WRI and Mr. S. Satapathy, Senior Consultant, MoEF&CC, Govt. of India.



NABARD's Presentation in COP 22 by DMD, Mr. H. R. Dave

The event was attended by the Co-Chair of GCF, Mr. Zaheer Fakir and the Manager of Adaptation Fund, Mr. Mikko Ollikainen. Besides, over 50 delegates; country representatives, national, bilateral and multilateral agencies representatives and civil society organizations attended the event. Initiating the discussion, Mr. Dave highlighted key initiatives of Government of India and NABARD in the area of climate change adaptation actions in India. He emphasized the community involvement and localised simple designing of adaptation actions as the cornerstone of India's success in the field of collective action and social mobilisation for climate actions. Mr. Rashmi outlined the key objectives of various climate missions launched by the Govt. of India, putting in place State Action Plans on Climate Change and setting up of Climate Change Centres in each State for effective climate actions in India. He emphasized that resources need to be sourced from both budgetary allocations and private sectors' corporate social responsibility funds.



Mr. H. R. Dave, DMD, NABARD addressing the Audience

Climate Finance Readiness Workshop for Asia, Asia Pacific & Eastern Europe Region during 23-25 August 2016

The CF Readiness workshop was jointly organised by NABARD, Adaptation Fund, United Nations Environment Programme (UNEP), Ministry of Environment (Govt. of Japan) and Climate Action Network South Asia (CANSAs). The event was attended by 53 representatives of 36 countries in Asia, Asia-Pacific and Eastern European Region. The Climate Finance Readiness Workshop was aimed to build capacities of the prospective National Implementing Entities (NIEs) under Adaptation Fund regarding international climate finance mechanisms, accreditation and project development processes. While inaugurating the workshop, Dr. Harsh Kumar Bhanwala, Chairman, NABARD emphasized on building of climate change resilience in rural areas and highlighted the major initiatives taken-up by NABARD in close coordination with MoEF&CC, GoI.

He expressed that the workshop would help in exchanging country's learnings related to Climate Finance, increasing the number of the Fund's accredited National Implementing Entities (NIEs) on the ground to reach more climate-vulnerable communities in the region with effective adaptation solutions. Mr. Koji Kumamaru, Ministry of Environment, Govt. of Japan, Mr. Vijay Samnotra, UNEP-India, Mr. H. R. Dave, DMD, NABARD, Mr. Farayi Madziwa, Adaptation Fund were also present during the inaugural session of the workshop. The valediction session was attended by Special Secretary Shri. R.R. Rashmi, IAS, MoEF&CC.



Inaugural address by Dr. Harsh Kumar Bhanwala, Chairman, NABARD



Publications released during Readiness Workshop



Valediction by Shri R.R. Rashmi, IAS
Special Secretary, MoEF&CC, Govt. of India



A group photo of participants of Climate Finance Readiness Workshop

Workshop on “Private Sector Facility under Green Climate Fund (GCF)”

NABARD jointly organized a workshop with (MoEF&CC) Govt. of India on Private Sector Facility under Green Climate Fund (GCF) on 29th August, 2016. The event was inaugurated by Hon'ble Minister of State (Independent Charge), MoEF&CC, Govt of India, Shri Anil Madhav Dave. The workshop was organized for nodal departments of State Governments, corporates and concerned ministries of Central Government. While inaugurating the workshop Hon'ble Minister emphasized that Indian agricultural scientists are perfectly capable of meeting the demands of our farmers and laid emphasis on the mobilization of financial resources for clean & green investment and sought greater involvement of stakeholders in the planning process. He also underlined the need to evolve a framework for impact assessment after completion of project and building of sustainability through our traditional knowledge base. Shri. Ravi Shankar Prasad, IAS, Joint Secretary explained the national priorities under Climate Finance and emphasized on quality proposals for GCF. Shri. H. R. Dave, DMD, NABARD during his welcome speech elaborated the role played by NABARD in channelizing national and international climate finance resources. He expressed need for generation of transformational and high impact projects under GCF and indicated that NABARD would provide all the necessary support in the process. Vote of thanks for inaugural session was delivered by Dr. B. G. Mukhopadhyay, CGM, FSPD, NABARD.



Inaugural speech by Hon'ble Union Minister of State (Independent Charge), Mr. Anil Madhav Dave

4th Regional Consultation Meeting at BIRD, Lucknow

The fourth meeting in the series of regional consultation meeting to support the State governments to proactively pursue climate change adaptation and mitigation and building their capacity for accessing climate change finance from domestic and international sources was organized by the Ministry of Environment, Forest and Climate Change (MoEF&CC), GOI in collaboration with Farm Sector Policy Dept., NABARD at BIRD Lucknow, from 27th to 28th June 2016. The meeting was inaugurated by Mr. Ajay Narayan Jha, IAS, Secretary, MoEF&CC. The meeting helped in generating several ideas for climate change projects from all the participants. It also enabled cross learning between States and Sectors which is expected to facilitate better quality projects. State representatives initiated work on identifying project concepts and thrust areas.



Inaugural session of business meet by Mr. A. N. Jha, IAS, Secretary, Mr. Ravi Shankar Prasad, IAS, Joint Secretary, Dr. D. V. Deshpande, Director BIRD

Major Workshops and Capacity Building Initiatives Organized by NABARD

Write Shop at Vijaywada, Andhra Pradesh

A four days Write - shop on development of Climate Change proposals with special emphasis on Green Climate Fund (GCF) was conducted by NABARD and GIZ during 4-7 October 2016 at Vijaywada, Andhra Pradesh. The Write shop was attended by 14 State Government officials from 5 States and one UT in addition to the 11 officers from NABARD. The participants were provided day wise thematic area training on Climate Change project conceptualization, formulation, approval process, investment, result management framework, etc. by Mr. Frank Udo Hoggle, Senior Research Scientist, Germany. A field visit was



Participants Interaction with the Local Community Members

undertaken to Adaptation Fund Board approved project on Integrated Mangrove Fishery Farming System (IMFFS) in Sorlagondi Village of Andhra Pradesh. The project is being executed by M.S. Swaminathan Research Foundation (MSSRF) in support with Praja Pragathi Seva Samiti (PPSS) in 3 villages of Krishna Mangrove Wetland areas of AP. During the visit, the participants experienced the live project interventions, interacted with local community members, shared their experiences, and explored the areas of conceptualizing/replicating scalable interventions in their respective States/UTs. The lessons and learnings from the said write shop was well appreciated by the participants.

Workshop for State Govt. Officials: Andaman & Nicobar Islands

NABARD, Andaman and Nicobar Regional Office, Port Blair, organised for the first time in Andaman and Nicobar Islands a two days' Capacity Building Workshop on Climate Change on 22 and 23 December 2016, in co-ordination with Department of Forests & Environment and Department of Science & Technology in Port Blair. The Workshop was inaugurated by Dr. Alok Saxena, IFS, Principal Chief Conservator of Forests and Principal Secretary, Department of Forests and Environment, Port Blair. Shri M.S. Negi, IFS, Principal Chief Conservator of Forests (Wildlife) attended the Workshop as Guest of Honour. Three project ideas related to mangrove conservation, waste management and solar energy were discussed and likely to be developed into fully developed proposals under various funding mechanisms.



Dr. Alok Saxena, PCCF, Dept. of Environment & Forest, Port Blair addressing the audience of workshop

Workshop For State Govt Officials at Ahmedabad, Gujarat

A one day State Level Workshop on Climate Change for State Govt. Officials was organized by Gujarat Regional Office on 20 December 2016 in the Regional Office in Ahmedabad with a view to sensitize them with the process of preparation of proposals under National Adaptation Fund for Climate Change (NAFCC) and Green Climate Fund (GCF) and also to discuss issues and strategies for firming up quality proposals on Climate Change.

A presentation on SAPCC of Gujarat and initiatives of State Govt. was also made by Climate Change Department, GoG. The participants shared their views and discussed on possible interventions for various Sector keeping vulnerability of State for Climate Change.



Delegates from State Line Departments interacting with NABARD officials

Workshop for NGOs on Climate Change, Gujarat

A one day State Level Workshop on Climate Change for representatives of NGOs and Civil Society Organisations was organized by Gujarat Regional Office on 22 December 2016 in the Regional office at Ahmedabad. The objective of the workshop was to sensitize our channel partners implementing our projects on Natural Resource Management about Climate Change financing under Green Climate Fund as well as to equip them to understand the framework of GCF for project proposal preparation.



Delegates from NGO's interacting with NABARD officials

Status of Climate Change Proposals

Total 24 Projects of worth Rs. 433 crore which comprises of 18 Projects (Rs. 374 crore) under NAFCC and 6 Projects (Rs.59 Crore) under Adaptation Fund have been sanctioned so far (Up to 31 Dec. 16).

Status of NAFCC: NAFCC was set up by MoEF&CC in 2015-16 and NABARD was made NIE in July 2015. State wise position of proposals under NAFCC is as under:

NAFCC : Projects in Pipeline



States where DPRs are under Preparation
UP, Bihar & Jharkhand



PCNs submitted to MoEF&CC - Sikkim, Nagaland, Arunachal Pradesh, Rajasthan & Gujarat (Since approved)



PCN preparation in Process - Uttarakhand, Tripura and Goa (States); A & N (UT)

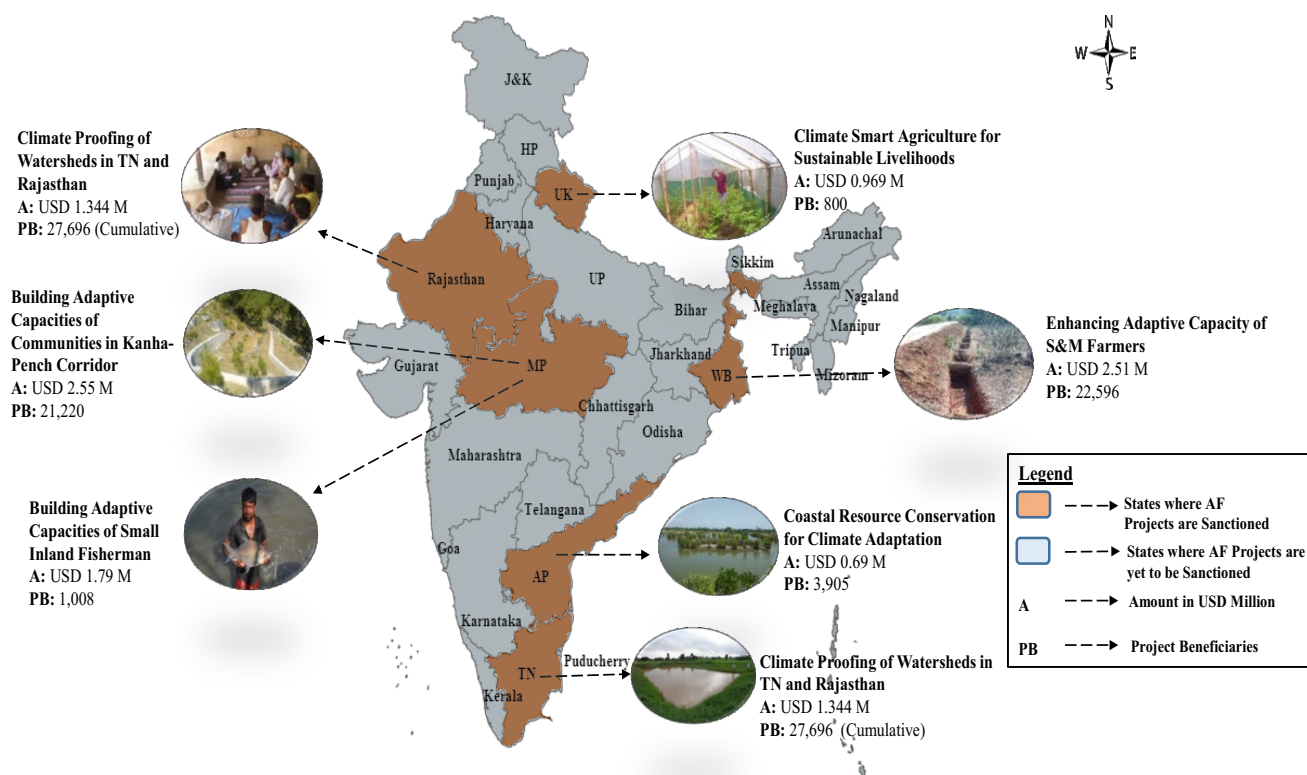
Status of Project Sanctioned under NAFCC



Status of Projects Sanctioned under Adaptation Fund

NABARD was accredited as National Implementing Entity (NIE) for Adaptation Fund (AF) in July 2012 and had initially taken-up initiatives towards capacity building of stakeholders for submission of feasible project proposals. A country cap of USD 10 million was given under Adaptation Fund against which six projects with an outlay of USD 9.8 million have been sanctioned which would benefit 77,225 vulnerable population spread over in six States [UK, MP (2Projects), TN & Raj (one combined project), AP, WB]. Project implementation in five projects has already been commenced and an amount of Rs.10.52 crore has been released for implementation. Recently sanction letter of Kanha Pench Corridor proposal has been issued for implementation of project.

Adaptation Fund Sanctioned Project

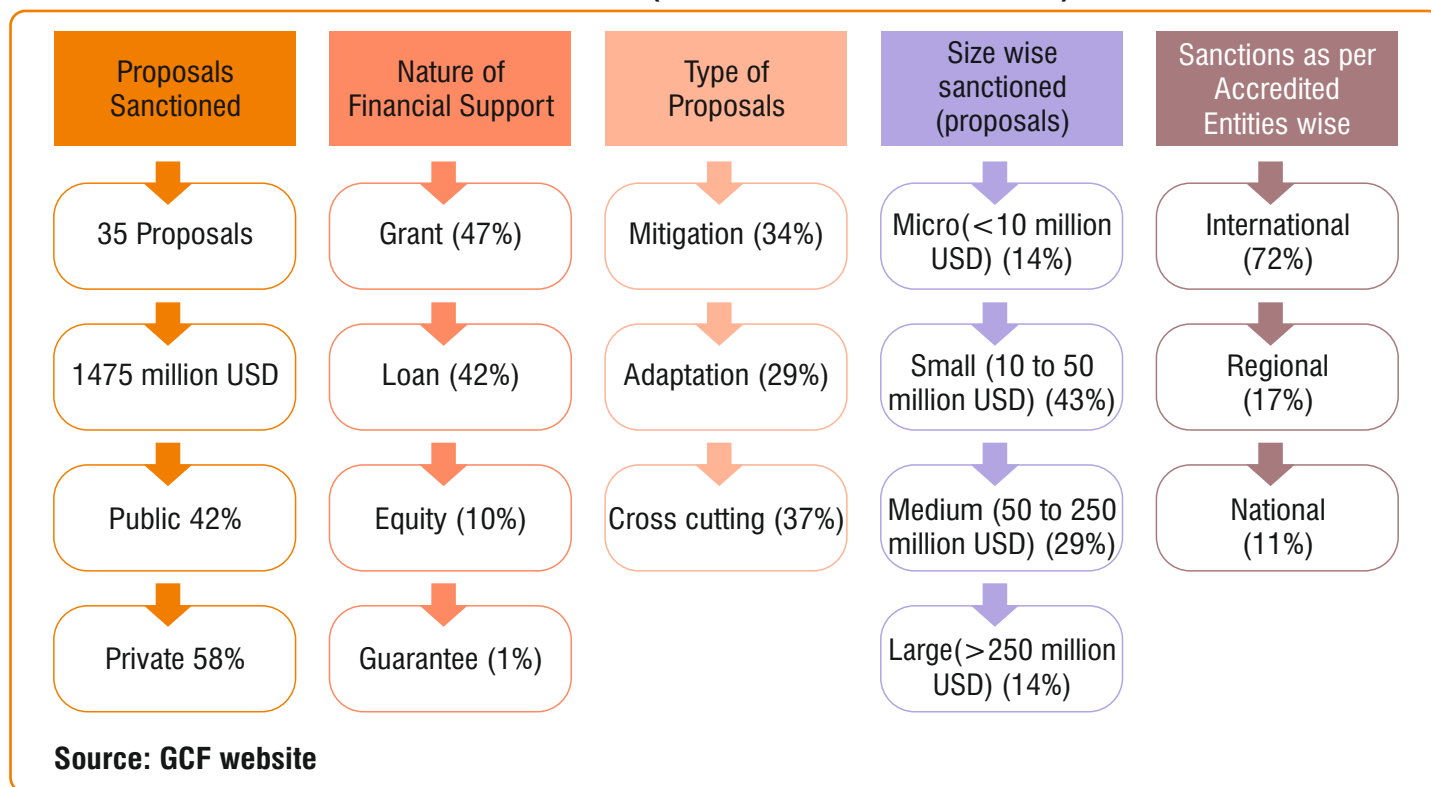


Adaptation fund has sanctioned an amount of USD \$ 25,000 for Environment, Social and Gender policy readiness of already sanctioned projects in Dec. 2016

Green Climate Fund

NABARD has been accredited as Direct Access Entity (DAE) in 10th Board meeting of GCF in July 2015 and is eligible to submit large size projects having outlay of more than USD 250 million. GCF supports both adaptation and mitigation interventions through various financial instruments such as grants, loan, equity and guarantee.

GCF at A Glance (As on 31 December 2016)



One Funding Proposal on "Ground water recharge and Solar Micro Irrigation to ensure food security and enhance resilience in vulnerable tribal areas of Odisha sustainable management in vulnerable tribal areas of Odisha" is submitted to GCF for grant of USD 34.35 million.

One DPR on "Mitigating Climate Change and Enhancing Adaptations for Farmers through Agro-forestry in Haryana (MCCEAF) is under finalization [USD- 40 million (Approx)]

PCN approved by Empowered Committee on "Increasing climatic resilience of urban water management system of Hyderabad" is submitted to GCF (USD- 245 million grant from GCF)

Preparatory works of Two DPRs (Innovative Debt Fund for Off Grid Companies" and Installation of 30,000 Solar Pumps) have started. PCNs were approved by Empowered Committee.

Other Initiatives taken

- Collaborations and networking with institutions such as UNEP, World Resources Institute, Global Green Growth Institute (GGGI), etc.
- Setting up of Climate Change Fund with an initial corpus of Rs. 5 crore
- Chapter on Climate Change introduced in PLPs for mainstreaming it in the planning process.
- All ROs have been sensitized for preparation of GCF proposal in consultation with nodal or line depts of State Governments.

Solar Power Irrigation Cooperative Enterprise (SPICE) in Dhundi Village, District Kheda, Gujarat: An Innovative Approach

A quick study was made by NABARD officials to “Solar Power Irrigation Cooperative Enterprise (SPICE) in Dhundi Village, District Kheda, Gujarat on 19 December 2016 which was developed by IWMI-Tata Water Policy Research Programme as a part of their Action Research Projects. There were 16 members of the cooperative and six of them were having solar pumps (3 farmers of 5 hp each and 3 farmers of 7.5 hp each) in their fields. The average investment cost is estimated at Rs.9.4 lakhs which varied between Rs. 8 lakh for 5 hp and Rs.10.80 lakh for 7.5 hp. The higher investment cost is on account of grid connectivity which requires poles, cables, metres and other accessories. The process of solar cooperative formation was started on 5 August 2015 by way of group formation for solar pump installations on 23 November

2015. The solar cooperative society was registered on 16 February 2016 and surplus electricity supply to grid started on 10 May 2016. Six members who were selected for solar pumps by IWMI were having wells and diesel pump sets and used to grow only cereals and pulses crops.



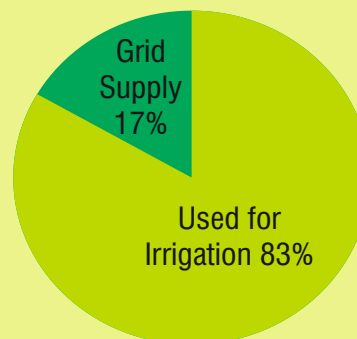
Solar farming in the Agriculture field

Name of farmer	Motor (hp)	Panel Specification	Solar Unit Capacity (kW)	Cost of solar Assembly(Rs)*	Contrib. of farmers (Rs.)
Pravin Bhai Parmar	5	250W/32 panels	8	8,00,000	40000
Kiritbhai Solanki	5	-do-	8	8,00,000	40000
Ramabhai Chavda	5	-do-	8	8,00,000	40000
Udabhai Chavda	7.5	300 W/36 panels	10.8	10,80,000	54000
Fudabhai Parmar	7.5	-do-	10.8	10,80,000	54000
Laxmanbhai Parmar	7.5	-do -	10.8	10,80,000	54000
Total				56,40,000	2,82,000

* Cost of entire solar assembly under project includes 6 invertors, 6 VFDs, 12 meters, one transformer, 72 poles, 2.8 KM grid length (cost @ Rs.3.00 lakh/Km), 06 change over switches. It does not include the cost of pumps as participating farmers are already having the pumps. SPICE had installed its own transformer of 100 kVA capacity.

Power Purchase Agreement (PPA) between SPICE and Madhya Gujarat Vij Company Limited (MGVCL) was signed on 23 December 2015 for 25 years and farmers started selling their surplus power produced to the DISCOM since 10 May 2016. Main features of the PPA agreement were power purchase by MGVCL at Rs. 4.63/kWh subject to no other subsidy, minimum yearly supply of 500 kWh from each solar pump, installation of suitable metering system by SPICE, power evacuation at a single metering point, cost of infrastructure for single metering point to be borne by SPICE, losses in the micro

Electricity Generated through Solar (between 10 May to 23 Nov 2016) - 29014 KWh



grid to be borne by SPICE, no conventional agricultural connection on the same survey number and sale of Renewable Energy Certificates (RECs) would accrue to the DISCOM. Electricity generated from each solar panel comes to an assembly at individual farmer level where he may use it for operating pump or he may drain into the common metering system. The farmers have shifted their some area under vegetable crops and also supplied

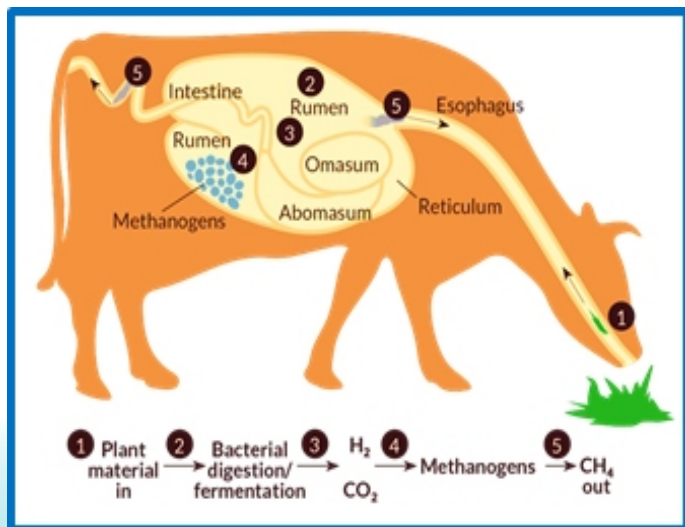
water to nearby farmers which were inturn benefitted by way of saving in diesel expenditure. The issues related to exploitation of ground water and use of drip sets may be addressed in long term by way of putting a condition by DISCOM in PPA. However, the replacement of diesel pump sets through solar pumps will significantly reduce carbon intensity as well as also increase the income of farmers through supplying power to the grid.

Campaign on Climate Change

Low GHG emissions and building up of climate resilience among local communities are two key component to address the global warming. In this connection, NAPCC and SAPCCs have highlighted common interventions which needs to be popularised among local communities through “Climate Change Campaign”. In this connection, two areas of “Climate Change Campaign” have been indicated below and in subsequent publications other areas of the “Climate Change Campaign” would be continued.

Campaign 1-Reduction in Methane Emission (Mitigation Measures) : Methane (CH_4) is a potent greenhouse gas (GHG) which is emitted from a variety of anthropogenic and natural sources. More than 70 percent of global CH_4 emissions are related to anthropogenic activities. Anthropogenic sources include fossil fuel consumption, animal husbandry (enteric fermentation & manure mgt.), paddy rice cultivation, biomass burning and waste mgt. Emissions from enteric fermentation of the ruminants contribute significantly to GHG inventories (Sejian et al., 2011a). There are two main factors influencing global warming change, an increase in GHG emissions and depletion of the ozone layer. Methane is associated with both factors. Enteric

fermentation emitted 10.09 million tonnes of CH_4 and is responsible for 73% of total methane emission from agriculture sector in India (INCCA, 2010). Buffalo is the single largest emitter of methane due to its higher methane emission coefficient i.e. 50 kg/animal/year (NATCOM, 2004) and constitutes 42% of the total methane emission from livestock sector for the year 2003 (Chhabra et al. 2009). The Methane emissions in dairy cows represent values from 151 to 497 g/day. Lactating cows produced more CH_4 (354 g/day) than dry cows (269 g/day) and heifers (223 g/day). So total emission of Methane from bovines is enormous. The emission of Methane can be reduced by adopting efficient feeding practices and use of gohar/bio gas plants.



Enteric Fermentation in Cattle.

Campaign 2: Strengthening of Soil Organic Carbon (SOC): Soil Organic Carbon sequestration is the process of transferring CO_2 from the atmosphere into the soil through crop residues and other organic solids and in a form that is not immediately re-emitted. This transfer or “sequestering” of carbon helps off-set emissions from fossil fuel combustion and other carbon-emitting activities while enhancing soil quality and long-term agronomic productivity. Soil carbon sequestration can be accomplished by management systems that add high amounts of biomass to the soil, cause minimal soil disturbance, conserve soil & water, improve soil structure and enhances Soil faunal activities.



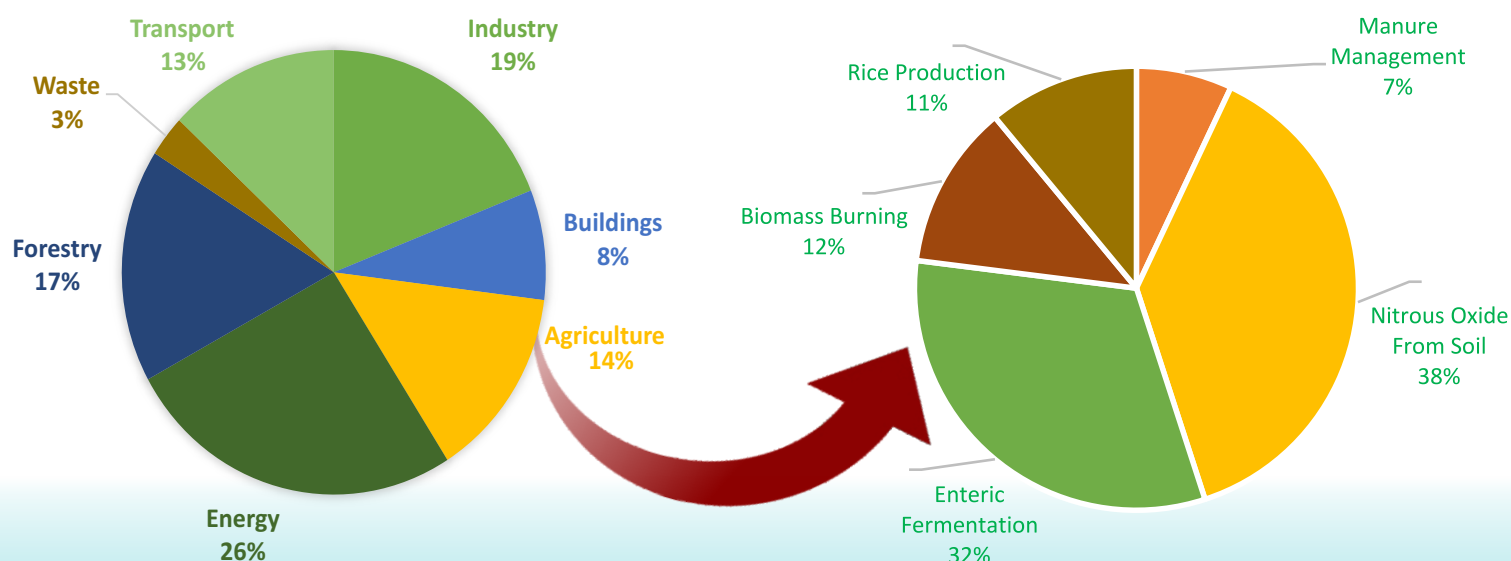
Management Practices for Soil Carbon Sequestration

Consequences of Soil Carbon loss: SOC losses result in higher atmospheric CO₂ concentrations, soil properties and biodiversity, leads to decreased cohesion between soil particles, which increases the susceptibility of soil to water/wind erosion, accelerates losses of bulk soil and alters nutrient and water cycling. Degradation of soil structure reduces the soil volume for water storage and soil permeability which lead to run off and flooding and reduces groundwater recharge during rain events. Another consequence of soil carbon loss is the loss of soil nutrients. (Malamoud et al. 2009).

Some Facts about Soil Carbon :

- ✓ Soil holds 81% of total carbon and current rate of carbon loss/year is between 0.7-2.1 Gt/year.
- ✓ Two most crucial anthropogenic processes which release the CO₂ into the atmosphere are burning of fossil fuel and change in land use pattern such as deforestation, soil erosion, tillage operations, biomass burning, use of excessive fertiliser and residue removal.
- ✓ Soil with higher clay content sequester carbon at higher rate.
- ✓ Soil carbon influences nutrient release, water release, root growth, biotic habitat and soil degradation.
- ✓ A rise in temperature by 2°C is estimated to release an additional 10Gt Carbon per year to the atmosphere through soil respiration (Friedlingstein et.al.2003).

Contribution of different Sectors to GHG Emissions at Global Level (Source : IPCC 2007)



Major Interventions Supported under NAFCC Projects

Sr No.	Title of the Project	Major Interventions identified in Sanctioned Proposals
1	Towards Climate Resilient Livestock Production System in Punjab by Punjab State Council for Science and Technology, Government of Punjab (Rs. 17.40 crore)	<ul style="list-style-type: none"> Climate Proofing of Registered Gaushalas Construction of climate smart model cattle ponds for 2,000 cattle's Develop weather linked Insurance mechanism and Capacity building of the community
2	Conserve water through the management of run-off in the river basin to improve ground water recharge to reduce vulnerability and enhance resilience for traditional livelihood in Nuapada by Department of Water Resources, Govt. of Odisha (Rs.20 Crore)	<ul style="list-style-type: none"> Construction of check dams Installation of drip & sprinkler irrigation systems Introduction of horticultural crops, fisheries in farm ponds, and poultry for livelihood diversification Installation of solar pumping system Formation of pani panchayats and publication of resource material for CC
3	Sustainable Livelihoods of Agriculture-Dependent Rural Communities in Drought Prone District of Himachal Pradesh through Climate Smart Solutions by Department of Environment, Science & Technology, Government of Himachal Pradesh (Rs.20 Crore)	<ul style="list-style-type: none"> Vulnerability assessment of Sirmour district Poly lining in hilly areas to arrest water percolation losses, To develop network of Farmer Producer Organisations (FPOs) Inclusion of weather based risk transfer instruments and conducting training and capacity building initiatives of the community
4	Model Carbon Positive Eco-Village In Phayeng Of Manipur by Directorate of Environment, Govt. of Manipur (Rs.10 Crore)	<ul style="list-style-type: none"> Climate proofing of the canal systems Introduction of horticultural species, SRI, integrated pest and nutrient management and scientific piggery in Phayeng Village Integration of solar street lighting systems Institutional development. Development of resource center for documentation of traditional knowledge
5	Management and rehabilitation of coastal habitats and biodiversity for Climate Change Adaptation and Sustainable Livelihood in Gulf of Mannar, Tamil Nadu, India by Department of Environment, Government of Tamil Nadu (Rs.24.74 crore)	<ul style="list-style-type: none"> Conduct baseline climate change vulnerability studies of coastal ecosystems and coastal communities living in and around Kariyachalli & Vilanguchalli and Vaan Islands of Tuticorin District, Tamil Nadu Conduct Coral and Sea Grass Rehabilitation in degraded areas, deploy artificial coral reefs Promote Eco-development activities in 23 coastal villages
6	Promotion of integrated farming system of Kaipad in coastal wetlands of North Kerala by Agency for Development of Aquaculture, Kerala (ADAK) – Rs.25 Crore	<ul style="list-style-type: none"> Construction of a strong earthen bunds and sluice gates to regulate water level Promote simultaneous cultivation of rice and shrimp / fish for better productivity & harvest in Pokkali and Kaipad coastal wetlands Provide support for purchasing farm and fishing equipment's, and Capacity building of coastal communities for enhancing the coping strategies

7	Sustainable Agriculture Development through Expansion, Enhancement and Modelling by Department of Agriculture (Crop Husbandry), Government of Mizoram (Rs.10.38 crore)	<ul style="list-style-type: none"> ▪ Baseline climate change vulnerability assessment of 150 project villages ▪ Provide seasonal climate forecast, install automated weather stations, promote soil and moisture conservation works, reduce area under Jhum cultivation, ▪ Restore community water tanks and construct rain water harvesting structures ▪ Establish farmers' field school and promote direct seeded rice cultivation, SRI & IPM
8	Climate Adaptation Strategies in Wetlands along Mahanadi River Catchment areas in Chhattisgarh by State Centre for Climate Change, Aranya Bhavan, Raipur, Govt. Of Chhattisgarh (Rs.21.47 crore)	<ul style="list-style-type: none"> ▪ Vulnerability assessment of 20,000 ha. Watershed area of 3 Watersheds ▪ Promote water conservation, catchment area treatment, river bank plantation, pond bunding and crop diversification. ▪ Enhance the adaptive capacity of farmers and other wetland dependent local communities through agro and farm management advisories and knowledge management in goatry, poultry, duckery, fisheries, and sustainable collection, processing and marketing of NTFPs
9	Climate Resilient Sustainable Agriculture in Rain-Fed Farming (Kandi) Areas of Jammu and Kashmir by Agriculture Production Department, Government of Jammu and Kashmir (Rs.22.52 crore)	<ul style="list-style-type: none"> ▪ Vulnerability assessment, promotion of mixed farming, scientific crop-water management system ▪ Introduction of polyhouse, crop diversification, organic farming, farmers orientation on tillage and residue management ▪ Capacity building of farmers on INM, IPM, and Agricultural Extension Service
10	Spring-shed development works for rejuvenation of springs for climate resilient development in the water stressed areas of Meghalaya by Directorate of Soil and Water Conservation, Government of Meghalaya (Rs.22.92 crore)	<ul style="list-style-type: none"> ▪ Inventorisation of the spring-sheds , development of a detailed landscape based climate resilient spring shed development plan for Vulnerable districts ▪ Promotion of scientific livestock management practices for piggery, poultry, dairy, agro-silviculture and horticultural interventions ▪ Capacity building of para-hydro geologists and interfacing line depts on spring-shed rejuvenation
11	Resilient Agricultural Households through Adaptation to Climate Change in Telangana by Environment Protection Training and Research Institute (EPTRI), Government of Telangana, Gachibowli, Hyderabad (Rs.24 crore)	<ul style="list-style-type: none"> ▪ To conduct baseline household level surveys on climate vulnerabilities ▪ Demonstration of micro irrigation in high value crops, farm ponds, alternate furrow /strategic irrigation, bore-well recharge structures, popularization of cash crops ▪ Integrated farming systems approach for increasing economic resilience ▪ Adoption of livelihood diversification practices such as backyard poultry, Small ruminants, inclusion of fodder crops in the system/ fodder trees on bunds plantation, silage, Vermicomposting, silt application etc

12	Renovation of Ponds and construction of recharge structures in the renovated ponds to augment recharge by Department of Science and Technology, Government of Puducherry (Rs.16.76 crore)	<ul style="list-style-type: none"> Rejuvenation of 20 no's of irrigation tanks, 32 no's of village ponds to increase ground water recharge and water storage capacity in the NW region of Puducherry Increase livelihood assets of local communities through promotion of high yielding crop varieties and capacity building of tank user associations for equitable sharing of benefits
13	Climate Resilient Interventions in Dairy Sector in Coastal and Arid Areas in Andhra Pradesh by Department of Animal Husbandry, Government of Andhra Pradesh (Rs.11.53 crore)	<ul style="list-style-type: none"> Development of 6 climate resilient cattle hostels, 12 underground water storage tanks and rain water harvesting structures, 6 biogas units, 12 solar pumps, 6 biogas powered milk chilling units, and cow urine processing unit, 6 automatic weather Procurement and distribution technique of pure indigenous varieties of cattle, promotion of AI to enhance their livestock resilience, development of fodder banks, and conducting workshops on design of heat resistant cattle sheds and best practices in each of the project districts Carrying out training and capacity building initiatives
14	Scaling-up Climate Resilient Agriculture Practices towards Climate Smart Villages (CSVs) in Haryana by Department of Agriculture, Govt. of Haryana (Rs.23.44 crore)	<ul style="list-style-type: none"> Adoption of CSA practices and prioritization of adaptation interventions in 250 project villages in 10 districts of Haryana Promotion of conservation agriculture based management practices (zero tillage, DSR, residue management), cropping system optimization/ diversification; decision support (Nutrient Expert) and sensor (Green-Seeker) precision water management (laser levelling, micro-irrigation), stress resilient cultivars, seed and fodder banks powered with value-added weather forecasts; ICT based agro-advisories
15	Conservation and Management of Indigenous Varieties of Live Stocks (Cattle and Sheep) in the wake of Climate Change in Karnataka by Department of Animal Husbandry and Veterinary Services, Govt. of Karnataka (Rs.24.92 crore)	<ul style="list-style-type: none"> Conservation & revitalization of local cattle and sheep breeds and their germplasm, scientific feed, fodder, and potable water management, promote knowledge development and sharing for climate resilient livestock management aligned with national and state policies
16	Increasing Adaptive Capacity to Climate Change through Development of Climate-Smart Villages in Select Vulnerable Districts of Madhya Pradesh by State Knowledge Management Centre on Climate Change (SKMCC), EPCO and Urban Development and Environment Department, Government of Madhya Pradesh (Rs. 25 crore)	<ul style="list-style-type: none"> Development of climate compatible crop, water, energy, nutrient management practices and agro-advisory services in Sehore, Rajgarh and Satna districts of MP Promotion of Drought Tolerant Kharif and Legume based Rabi crops, Water Harvesting, Protective Irrigations, Erosion Control, alternative energy sources & solar pumps, Site and crop specific nutrient management, ICT- Insurance based Agro-advisory through Weather-Insurance, skill development through conducting training and capacity building workshops

17	Rain Water Harvesting and Sustainable Water Supply to the Hilly Areas in Darjeeling as an Adaptive Measure to Potential Climate Change Impacts (Rs. 23.12 crore)	<ul style="list-style-type: none"> Preparation of database from a GPS based survey for better planning of water services and infrastructure development for building climate resilience Setting up of individual household rain water harvesting facilities of 30 lakh litres (3000 households @ 1,000 Litre) of storage tanks and related piping for 3,000 households. Setting up of 15 lakh litres of community storage tanks for 200 Households Reduction in various water borne diseases through supply of safe potable water
18	Management of Ecosystem of Kaziranga National Park by Creating Climate Resilient Livelihood for Vulnerable Communities through Organic farming and Pond Based Pisciculture in Kaziranga National Park, Assam (Rs. 24.56 crore)	<ul style="list-style-type: none"> Creation of opportunities for vulnerable communities to adapt to impacts of climate change through promotion of the organic farming, breeding of local variety of crop and fishes, watershed management, restoration of surface water bodies and training & capacity building in initiatives Regulation of carbon emission due to reduction of Jhum based cultivation and reduction of man-animal conflict

Latest Development in Climate Change Initiatives

- ✓ Three of our earlier Climate Change Vertical publications namely "Booklet - Campaign on Climate Change" notably was awarded 56th ABCI Annual Awards in Cat 24 Environmental Category and Srujana Magazine in Cat 13 Features (Language) Category. Further, 2nd issue of the Climate Change Newsletter was awarded a prize in PRSI National Awards 2016 Newsletter (English) - Scribbles Category.
- ✓ On 5 October 2016, the threshold for entry into force of the Paris Agreement was achieved. The Paris Agreement entered into force on 4 November 2016. So far, 127 Parties have ratified out of 197 Parties to the Convention.
- ✓ The first session of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA 1) took place in Marrakech, Morocco from 15-18 November 2016.
- ✓ Total 35 proposals of 1.5 billion USD have been sanctioned up to 15th GCF board meeting held between 12 to 15 December 2016 at Apia, Samoa.
- ✓ Empowered Committee Meeting of MoEF&CC held on 27 September 2016 at New Delhi, approved 3 PCNs (Innovative Debt fund for Off Grid Energy Companies, Installation of 30,000 solar pumps and Waste Water Management in Hyderabad City).



Climate Change & NIE Vertical Farm Sector Policy Department

National Bank for Agriculture and Rural Development

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